PANTEX PROBABILISTIC SEISMIC HAZARD ANALYSIS CONCEPTUAL PLAN

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Abstract

The Pantex Plant is carrying out a step-by-step process to evaluate its probabilistic seismic hazard analysis (PSHA) in light of new information that has become available since the PSHAwas updated in 1998 (Lawrence Livermore National Laboratory [LLNL], 1998). This evaluation is intended to meet the requirements of U.S. Department of Energy (DOE) Order 420.1C, Facility Safety, Chapter IV, Natural Phenomena Hazard Mitigation. In 2013, the first phase of a program to update the Pantex PSHA was carried out. In that study, the impact of the Central and Eastern United States Seismic Source Characterization (CEUS SSC) model was evaluated for its impact to the existing PSHA results. Relevant seismic sources from the CEUS SSC model, supplemented by seismic sources from the LLNL (1998) PSHA for areas not covered by the CEUS SSC model, were used as input for a limited updated PSHA. The ground-motion characterization (GMC) model and the treatment of site response were constrained to follow the same approaches as implemented in the 1998 PSHA. Building on that initial assessment a Conceptual Project Plan (Plan) for the updating the Pantex PSHA has been developed. A summary of the Plan will be described including efforts to develop possible tasks, schedules, and costs needed to update the PSHA, site response analysis (SRA), and the site design basis earthquake ground motions. The plan for the SRA assumes that it will follow a Level 3 process within the framework described by the Senior Seismic Hazard Analysis Committee (SSHAC). The steps to execute a SSHAC Level 3 SRA will be summarized. The Plan also includes possible field and laboratory investigations to obtain site-specific geotechnical data. These were developed considering current data gaps. The investigations program scope is based on DOE and national standards guidance, an analysis of existing Site and regional data, and an evaluation of data needed for SRA. A SRA sensitivity analysis also guided development of the investigations program scope by illuminating the inputs that have a significant impact on site amplifications. Insights from the SRA sensitivity analysis will be reviewed and the investigations program scope will be summarized. Insights into what site investigation approach is most cost-effective and provides the greatest amount of necessary site data for site response will also be described.